



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/863,059	05/22/2001	Hisanori Kawakami	9319S-000205	7384
27572	7590	06/25/2004	EXAMINER	
HARNESS, DICKEY & PIERCE, P.L.C. P.O. BOX 828 BLOOMFIELD HILLS, MI 48303			QI, ZHI QIANG	
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 06/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/863,059

Applicant(s)

KAWAKAMI ET AL.

Examiner

Mike Qi

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 May 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5,8,9,11 and 13-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-5,8,9,11 and 13-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1/27/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 11 is objected to because of the following informalities: the claim 10 has been canceled, so that the claim 11 cannot be dependent on the claim 10. The claim 11 should be dependent on the claim 9. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 2000-98415 (Mtsuru).

Claim 1, Mitsuru discloses (col.1, line 45 – col.3, line 47; Figs.1-6) a structure of liquid crystal display device comprising:

- a liquid crystal panel (10) (generally, the liquid crystal panel has a pair of substrates holding the liquid crystal therebetween);
- a light guide (7) provided opposite to one of the substrates;
- a flexible wiring board (9) (flexible substrate) connected to one of the substrates, the flexible wiring board (9) (flexible substrate) being bent around a light receiving surface (7a) of the light guide (7) (shown in Fig.1);

Art Unit: 2871

- a light emitting diode (3) (light emitting device LED) mounted on the flexible wiring board (9) (flexible substrate), the light emitting device (3) including: a light emitting surface (a) adjacent the light receiving surface of the light guide (7) (shown in Fig.1), and a mounting surface mounted to the flexible wiring board (9) (flexible substrate);
- the light emitting surface (a) is disposed on a surface opposite to the mounted surface of the light emitting device (3), but the light emitting surface is also adjacent the mounting surface that is shown in Fig.1 and that is the same position as the Fig.2 of this application, such as the light emitting surface (24) is disposed on a surface opposite to the mounted surface of the light emitting device (21) and the light emitting surface is also adjacent the mounting surface.

Claim 8, Mitsuru discloses (col.1, line 45 – col.3, line 47; Figs.1-6) that the flexible wiring board (9) (flexible substrate) has a drive driver (4) (driving circuit for supplying signal) for driving the liquid crystal.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2871

5. Claims 3-5 and 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mitsuru as applied to claims 1 and 8 above.

Claims 3-5, Mitsuru discloses (col.1, line 45 – col.3, line 47; Figs.1-2) that the flexible wiring board (9) (flexible substrate) has a terminals (2) connected to one of the LCD panel substrates, and the light emitting diode (3) is provided on the same surface of the flexible wiring board (9) as the surface where the terminal (2) is provided.

The wiring pattern can be provided either on the side opposite to the LED or on the side of the LED. The wiring pattern is provided on the side opposite to the LED, so that the wiring connection for the terminal wiring and the LCD panel must be through a through hole. If the wiring pattern is provide on the side of the LED, the wiring connection for the terminal wiring and the LCD panel must avoid the light emitting device such as LED for achieving the electrical connections being as short as possible.

Claim 19, lacking limitation is such that an electronic device using a liquid crystal device as claimed in claim 1 such as a flexible substrate connected to a control circuit to control the operation of the liquid crystal and a light emitting device is mounted to the light receiving surface of a light guide that would be only given weight as intended use. Because any display can be used for an electronic device, and that would have been at least obvious.

6. Claims 9, 11,13-18, 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2000-98415 (Mitsuru) in view of US 6,315,440 (Sato).

Claims 9 and 20, Mitsuru discloses (col.1, line 45 – col.3, line 47; Figs.1-6) that a structure of liquid crystal display device comprising:

Art Unit: 2871

- a liquid crystal panel (10) (generally, the liquid crystal panel has a pair of substrates holding the liquid crystal therebetween);
- a light guide (7) provided opposite to one of the substrates;
- a flexible wiring board (9) (flexible substrate) connected to one of the substrates;
- a light emitting diode (3) (light emitting device LED) mounted on the flexible substrate (9) being bent around a light receiving surface (7a) of the light guide (7).

Mitsuru does not explicitly disclose that the light guide having a light receiving surface including a recess formed therein; and a light emitting surface of the light emitting device having a projection portion and the projection portion is disposed in the recessed portion, i.e., the projection portion is engaged with the recessed portion for mounting the light emitting device to the light receiving surface of the light guide.

However, Satoh discloses (col.4, line 28 – col.5, line 21; Figs.2-3) a liquid crystal display using flexible substrate (21), and two positioning through holes (26) provided on the forward end side of the flexible substrate (21) are respectively fitted to two positioning bosses (27) provided erectly on the back side of the holding member (22), so that the flexible substrate (21) is positioned. Although the positioning means is for positioning the flexible substrate (21) to the holding member (22), but that is the same principle for positioning the light emitting device such as LED to the light guide, and the two parts would be correspondently engaged together (the LEDs such as LED 23 would be the positioning bosses and the recesses on the light receiving surface of the light

Art Unit: 2871

guide such as light guide 20 must have positioning through holes to receive the LEDs). To position two parts using positioning means such as one part having projections and the other part having corresponding recesses so as to engage the two parts together (like a male part and a female part engaged together) was a conventional, and as a general available knowledge, using such positioning means correspondently engage the LEDs with the light guide would increase the light utilization efficiency (minimizing the light lose).

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to design a recessed portion in the light guide and a projection portion in the light emitting surface of the light emitting device for mounting the light emitting device to the light guide as claimed in claims 9 and 20 for achieving the correspondently mounting the light emitting device to the light receiving surface of the light guide so as to increase the light utilization efficiency, and improving the display brightness.

Claim 21, Mitsuru discloses (col.1, line 45 – col.3, line 47; Figs.1-6) that a structure of liquid crystal display device comprising:

- a liquid crystal panel (10) (generally, the liquid crystal panel has a pair of substrates holding the liquid crystal therebetween);
- a light guide (7) provided opposite to one of the substrates;
- a flexible wiring board (9) (flexible substrate) connected to one of the substrates;

Art Unit: 2871

- a light emitting diode (3) (light emitting device LED) mounted on the flexible substrate (9) being bent around a light receiving surface (7a) of the light guide (7).

Mitsuru does not explicitly disclose that the light guide is formed in a bent shape.

However, Satoh discloses (Fig.3) that the light guide (20) having a bent shape, and the light emitting element (23) protruded into the recessed portion of the light guide, so that the light receiving surface thereof faces a direction opposite to the pair of substrates, and the light emitting surface of the light emitting element (23) faces the light receiving surface of the light guide and the pair of substrates. Satoh indicates (col.3, lines 1-4) that such illuminated structure obtained the display area being illuminated uniformly without causing any color shading or unevenness in brightness.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to design the light guide having a bent shape as claimed in claim 21 for achieving uniformly display and even brightness.

Claim 11, lacking limitation is such that the projecting portion comprising a cylindrical pin or triangle prism projection.

However, Satoh discloses (col.4, line 28 – col.5, line 21; Figs.2-3) using two positioning through holes (26) (recessed portion) and positioning bosses (27) (projecting portion such as the pin shape) as the positioning means so as to engage the two parts in a liquid crystal display, and using projection on one part and using recess on the other part as the positioning means would have been at least obvious. The projecting

Art Unit: 2871

portion using cylindrical pin or triangular prism or any other shape such as rounded top projection, etc., that would have been at least an obvious variations.

Claims 13-15, Mitsuru discloses (col.1, line 45 – col.3, line 47; Figs.1-2) that the flexible wiring board (9) (flexible substrate) has a terminals (2) connected to one of the LCD panel substrates, and the light emitting diode (3) is provided on the same surface of the flexible wiring board (9) as the surface where the terminal (2) is provided. The wiring pattern can be provided either on the side opposite to the LED or on the side of the LED. Because the wiring can be arranged on the both sides of the flexible substrate and that is conventional. If the wiring pattern is provided on the side opposite to the LED, the wiring connection for the terminal wiring and the LCD panel must be through a through hole, and that is conventional. If the wiring pattern is provide on the side of the LED, the wiring connection for the terminal wiring and the LCD panel must avoid the light emitting device such as LED, and that would have been at least obvious for achieving the connection as short as possible.

Claim 16, Mitsuru discloses (col.1, line 45 – col.3, line 47; Fig.1) that the light emitting surface (a) is at on the side of the mounted surface of the light emitting device (3) to the flexible wiring board (9) (flexible substrate), and the light emitting surface (a) is mounted facing to the light receiving surface (7a) of the light guide (7), and when the device assembled, the light emitting surface would be mounted to the light receiving surface of the light guide.

Claim 17, lacking limitation is such that the light guide is formed in a bend shape.

However, Satoh discloses (Fig.3) that the light guide (20) having a bent shape, and the light emitting element (23) protruded into the recessed portion of the light guide, so that the light receiving surface thereof faces a direction opposite to the pair of substrates, and the light emitting surface of the light emitting element (23) faces the light receiving surface of the light guide and the pair of substrates. Satoh indicates (col.3, lines 1-4) that such illuminated structure obtains the display area being illuminated uniformly without causing any color shading or unevenness in brightness.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to design a light guide having a bent shape as claimed in claim 17 for achieving uniformly display and even brightness.

Claim 18, Mitsuru discloses (col.1, line 45 – col.3, line 47; Figs.1-6) that the flexible wiring board (9) (flexible substrate) has a drive driver (4) (driving circuit for supplying signal) for driving the liquid crystal.

Response to Arguments

7. Applicant's arguments filed on May 25, 2004 have been fully considered but they are not persuasive.

Applicant's arguments are as follows:

1) The references do not teach that a light emitting surface of a light emitting device is adjacent to the surface of the light emitting device mounted to the flexible substrate.

2) The references do not teach that a light emitting surface of the light emitting device having a projection portion and the light guide having a recessed portion for mounting the light emitting device to the light receiving surface of the light guide.

3) The references do not teach that the light guide is formed in a bent shape.

Examiner's responses to Applicant's arguments are as follows:

1) The reference Mitsuru discloses (Fig.1) that the light emitting surface (a) is disposed on a surface opposite to the mounted surface of the light emitting device (3), but the light emitting surface is also adjacent the mounting surface that is shown in Fig.1 and that is the same position as the Fig.2 of this application, such as the light emitting surface (24) is disposed on a surface opposite to the mounted surface of the light emitting device (21) and the light emitting surface is also adjacent the mounting surface.

2) The reference Satoh discloses (col.4, line 28 – col.5, line 21; Figs.2-3) a liquid crystal display using flexible substrate (21), and two positioning through holes (26) provided on the forward end side of the flexible substrate (21) are respectively fitted to two positioning bosses (27) provided erectly on the back side of the holding member (22), so that the flexible substrate (21) is positioned. Although the positioning means is for positioning the flexible substrate (21) to the holding member (22), but that is the same principle for positioning the light emitting device such as LED to the light guide, and the two parts would be correspondently engaged together (the LEDs such as LED 23 would be the positioning bosses and the recesses on the light receiving surface of the light guide such as light guide 20 must have positioning through holes to receive the LEDs). To position two parts using positioning means such as one part having

Art Unit: 2871

projections and the other part having corresponding recesses so as to engage the two parts together (like a male part and a female part engaged together) was a conventional, and as a general available knowledge, using such positioning means correspondently engage the LEDs with the light guide would increase the light utilization efficiency (minimizing the light lose).

3) The reference Satoh discloses (Fig.3) that the light guide (20) having a bent shape, and the light emitting element (23) protruded into the recessed portion of the light guide, so that the light receiving surface thereof faces a direction opposite to the pair of substrates, and the light emitting surface of the light emitting element (23) faces the light receiving surface of the light guide and the pair of substrates. Satoh indicates (col.3, lines 1-4) that such illuminated structure obtains the display area being illuminated uniformly without causing any color shading or unevenness in brightness.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

Art Unit: 2871

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (571) 272-2299.

The examiner can normally be reached on M-T 8:00 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mike Qi
June 17, 2004



ROBERT H. KIM
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800